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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/614,374	07/12/2000	GOSUKE OSHIMA	TY-001	2254

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EXAMINER

VIGUSHIN, JOHN B

ART UNIT PAPER NUMBER

2827

DATE MAILED: 10/23/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/614,374

Applicant(s)

OSHIMA ET AL.

Examiner

John B. Vigushin

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 June 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14-17, 19-21 and 23-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 23-30 is/are allowed.
- 6) ☒ Claim(s) 14, 16, 17 and 19-21 is/are rejected.
- 7) ☒ Claim(s) 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. The present Office Action is responsive to Applicant's Amendment filed June 18, 2002 (Certificate of Mailing date: June 12, 2002). The Examiner acknowledges the amendments to Claims 14-17 and 19-21, the cancellation of Claims 1-13, 18 and 22, and the addition of new Claims 23-30. Accordingly, Claims 14-17, 19-21 and 23-30 are now pending in the instant amended Application.

Rejections Based On Prior Art

2. The following references were relied upon for the rejections hereinbelow:

*Mattei et al. (US 5,694,300)

*Horiba et al. (US 5,822,194)

*Harada et al. (US 5,966,294)

*Already of record in the instant Application.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 14, 16, 17, 20 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Mattei et al.

As to Claim 14, Mattei et al. discloses a BGA electronic device (col.1: 6-10), in Fig. 2: a substrate 10 having first (top) and second (bottom) generally planar surfaces,

wherein the first generally planar surface is parallel to the second generally planar surface; electronic parts 29-33 mounted on the first generally planar surface 9 (col.2: 35-41); a resin layer 26, 27 and 40 (col.2: 32-33; 56-61) disposed to surround at least one of the one or more electronic parts 29-33; a plurality of terminal electrodes (i.e., the balls of the BGA electronic device) disposed only on the second generally planar surface and electrically coupled (i.e., by means of vias 35) to the one or more electronic parts 29-33 (Fig. 2; col.2: 35-41).

As to Claim 16, Mattei et al. further discloses that substrate 10 comprises a rectangular solid of an inherently specified thickness (Fig. 1).

As to Claim 17, Mattei et al. further discloses that the resin layer 26, 27 and 40 comprises a rectangular solid of a specified thickness (col.2: 61-65), the resin layer disposed over the first generally planar surface (Figs. 1 and 2).

As to Claim 20, epoxy resin layer 26, 27 and 40 (col.2: 32-35) comprises, at the very least, insulation for the BGA electronic device functional circuits (col.2: 56-61).

As to Claim 21, the BGA electronic device comprises at least one electromagnetic field shielding layer 23 (col.2: 26-35), wherein the at least one layer 23 is disposed on at least a specified region of the resin layer 26, 27 and 40 (Figs. 1 and 2; col.2: 32-35 and 56-61).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Mattei et al.* in view of *Horiba et al.* and *Harada et al.*

I. *Mattei et al.* teaches all the limitations of base Claim 14 but does not teach that the epoxy resin layer comprises 26, 27 and 40 comprises a ferrite filler or a metal filler.

Horiba et al. discloses a substrate 1 with electronic parts mounted on a main surface and an epoxy resin encapsulant 3 having a filler of ferrite particles dispersed therein (Fig. 8: 44-46). *Harada et al.* discloses that ferrite filler dispersed in epoxy resin material inherently exhibits magnetic loss at high frequencies which enables the epoxy resin with ferrite filler to attenuate high frequency noise, i.e., electromagnetic interference (EMI) and thereby prevent malfunction of the circuit components due to EMI (col.17: 13-20; col.18: 16-22 and 38-42).

II. Since *Mattei et al.* and *Horiba et al.* both have epoxy resin parts that encapsulate the electronic components on the main surface of a substrate, then the ferrite filled epoxy resin part of *Horiba et al.* (having the inherent EMI reducing properties, as taught by *Harada et al.*) for use as EMI protection, as well as mechanical protection, of the encapsulated circuit would have been readily recognized as yet a further enhancement of EMI shielding in the pertinent art of *Mattei et al.*, who also recognizes the need to provide high frequency shielding (Fig. 2; col.1: 6-11) and discloses metallization layer 23 therefor (*Mattei et al.*: col.2: 26-32), and would, accordingly, benefit from the EMI teachings of *Horiba et al.* and *Harada et al.*

III. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further enhance the EMI shielding of the functional circuits 15-18, and the electronic parts 29-33 therein, by modifying the epoxy resin 26, 27 and 40, of *Mattei et al.*, with the ferrite filler as taught by *Horiba et al.*, in order to further enhance the EMI shielding of the electronic parts and functional circuitry formed on the BGA electronic device of *Mattei et al.* with the noise-suppressing EMI properties of the ferrite filler, as recognized and disclosed by *Harada et al.*

Response to Arguments

7. Applicant's arguments with respect to claims 14, 16, 17, 19-21 have been considered but are moot in view of the new ground(s) of rejection.

Allowable Subject Matter

8. Claims 23-30 have been allowed.

9. Claim 15 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter:

As to Claims 15 and 23-30, patentability resides in *an intermediate layer comprising an insulating elastic material interposed between the resin layer and the first*

generally planar surface, in combination with the other limitations of Claim 15 and base Claim **23**, respectively.

11. As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Miyajima (US 6,365,979 B1) discloses a Ball Grid Array package comprising a substrate 1 with an electronic part 7 mounted on a top surface of the substrate 1, surrounded by encapsulant 9, said substrate 1 having solder bump electrodes 10 disposed only on the opposite (bottom) surface of the substrate (col.6: 60-63) and electrically connected to the electronic part 7 by means of vias 3.

Status of the Office Action

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John B. Vigushin whose telephone number is 703-308-1205. The examiner can normally be reached on 8:30AM-5:00PM Mo-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on 703-305-9883. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7382 for regular communications and 703-308-7382 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

John B. Vigushin
Examiner
Art Unit 2827

jbv
October 21, 2002

Albert W. Paladini 10-21-02
ALBERT W. PALADINI
PRIMARY EXAMINER